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#### PSYCHROMETRIC TABLES.

In the MONTHLY WEATHER REVIEW for August, page 333, Mr. W. H. Alexander states that Molesworth's psychrometric tables were used by his correspondents in reducing their observations of the wet and dry bulb thermometer. In reply to an inquiry by the Editor, Mr. Alexander states that he has not been able to find a copy of these tables in St. Kitts, but has obtained a manuscript copy of the table actually used under Mr. Watts's direction. This is copied from Hurst's Handbook for Surveyors, and is identical with the tables of dew-point factors published by Glaisher in 1856, and which the reader will find reprinted on page 144 D of the Smithsonian Meteorological Tables, third edition, 1859. These factors are still used by English observers, and, in some cases, give approximate results if the psychrometer is not ventilated or exposed to a strong wind. In order to obtain the best results with the psychrometer, it must be ventilated at the rate of 5 to 10 feet per second and the corresponding tables first prepared by Ferrel and slightly amended by Assmann, Svensson, Marvin, and others must be used.

#### OBSERVATIONS DURING THE SOLAR ECLIPSE.

The observations at one hundred and fifty-four meteorological stations in India recorded during the solar eclipse of January 22, 1898, have been discussed and published by Mr. John Eliot, the Director General of Indian observatories, in a recent Indian meteorological memoir. The observations included the temperature of the air, barometric pressure, relative humidity, cloud and rainfall at all stations and solar radiation observations at six stations. The solar radiation thermometer is so much affected by the radiation from the surrounding inclosure and by the wind, as well as by its own sluggishness, that it must not be considered as an instrument for measuring solar radiation proper, but may, possibly, give us a fair indication of the changes in temperature of leaves and other objects exposed to the sunshine. The difference between the readings of the solar radiation thermometer and the dry bulb or air temperature in the shade, were directly proportional to the area of the unobscured portion

of the disc of the sun. The temperature of the surface of the ground was observed in isolated cases; the amplitude of the change in the interior of India was from 12° to 20° at the time of maximum obscuration. The temperature of the air diminished in proportion to the obscuration and amounted to 8° in the interior of India near the path of total eclipse. The maximum reduction of temperature was 12° at Karwar and the epoch of the greatest diminution of temperature averaged about twenty-three minutes later than the epoch of greatest obscuration. Mr. Eliot suggests that this large amount of retard may have depended somewhat upon inaccurate observations in the dim eclipse light, but it was practically the same over the whole area in which the sun's disc was obscured by eight-tenths or more. With regard to the barometric pressure Mr. Eliot states that there was a steady increase of pressure proceeding at a nearly uniform rate during the first stage of the eclipse; there was little or no variation during the second stage and, finally, during the restoration of sunlight an increase of pressure that continued after the termination of the eclipse.

The chief effects of these actions were (a) to decrease the amplitude of the diurnal variation on the day of the eclipse by amounts averaging about 0.035 inches in and near the belt of totality; (b), to accelerate the epoch of the afternoon minimum of the diurnal oscillation on the day of the eclipse by intervals averaging about forty-five minutes. The motion of the air was very considerably modified in amount and intensity, but not in direction; it fell off very rapidly during the first stage and was feeble during the greater part of the second stage. Light airs and calms prevailed during the time of greatest obscuration at an hour when the diurnal variation of the wind gives us the greatest velocity. At the majority of stations and near the belt of totality a short sudden gust occurred at twenty minutes after the commencement of the eclipse. This is shown at a large number of stations; the recorded velocity of the gusts varied between 10 and 26 miles per hour; at the first class stations the gust occurred one or two hours before the eclipse at 3 stations, but after the beginning at 10 stations; the gusts show a fairly regular progress from west to east. At twelve second and third class stations, in or near the belt of totality, the gusts occurred before the eclipse in four cases. On the average of all the 38 stations at which anemometers were used the mean air movement between 1 and 2 p. m., was only a third of that which prevailed during the preceding hour, and was even less than the movement in the early morning hours at the time of the diurnal minimum wind. In general, a series of gusts occurred about twenty minutes after the commencement of the eclipse and another series about half an hour after totality. The day was remarkably clear, and the atmosphere steady, and upward convective movements were feeble, more especially during the eclipse, when they were *nil*. There was a large and rapid increase of the pressure of aqueous vapor, and hence also of relative humidity commencing on an average about twenty minutes after totality, followed by an equally large and rapid decrease for about thirty minutes. This oscillation occurred at all stations without exception during the second half of the eclipse and was the most remarkable and unexpected phenomenon of all. The data at hand show clearly that this oscillation in humidity was transmitted from west to east with approximately the same velocity as that of the shadow of the moon; it was not due to an actual horizontal movement of the air, but passed across India with the shadow itself. It could not have been due to the ordinary processes of evaporation or diffusion of moisture, or to the slow horizontal movement of the air, as shown by the anemometer; the only action which could give rise to this oscillation is the descent of masses of air containing a larger quantity of aqueous vapor than the air at the surface. Mr. Eliot considers